



CITY OF  
TUCSON  
TUCSON WATER  
DEPARTMENT

## **Tucson Water Standard Specifications and Details 2011 Edition – Engineering Directive**

**Effective Date: October 13, 2014**

**SUBJECT: Revise Standard Specifications Boring and Casing SD-800**

### **STATEMENT OF PURPOSE**

This Directive shall define revisions to the 2011 Tucson Water Standard Specifications for Standard Detail (SD), SD-800 Boring and Casing. The revisions address open trench casing installation requirements, provide diagrams of the air gap and radial alignment parameters for the casing, and address pressure grouting of void spaces around the casing.

### **REVISIONS**

- Add comment to the Standard Detail Boring and Casing Sheet 2 of 3, diagram, “Undisturbed Earth”.
- Add comment to the Standard Detail Boring and Casing Sheet 2 of 3, details, “\*\*\* Open Trench Casing Installation Shall Comply with Pipe Bedding and Trench Backfill SD-115”.
- Add air gap and alignment detail and leader to the lower diagram of the Standard Detail Boring and Casing Sheet 3 of 3.
- Add comment with leader, “Undisturbed Earth with Annular Space/Voids Between Casing and Undisturbed Earth Shall be Pressure Grouted”.

### **AUTHORITY**

Arizona State Regulations, City of Tucson Ordinances, Tucson City Code and other enabling legislation which affect the production, treatment, distribution and control of potable and reclaimed water.

### **PROCEDURE**


New water system designs which include casings to protect carrier pipe shall reflect these requirements.



## PROCEDURAL RESPONSIBILITY

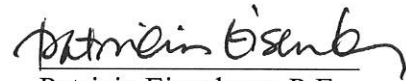
The Engineering Administrator for Tucson Water and /or designated representative(s) are responsible for the enforcement of this Directive and the associated standards.

### RECOMMEND



Jeffrey Drumm, P.E.  
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### CONCUR



Patricia Eisenberg, P.E.  
Chief Engineer  
Planning & Engineering Division



## GENERAL

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS, TRAFFIC CONTROL, SHORING AND BRACING OF JACKING AND RECEIVING PITS, BEDDING, BACKFILL, OVER EXCAVATION, COMPACTION AND ANY OTHER WORK NOT SPECIFICALLY MENTIONED HEREIN, CONSIDERED BY THE AGENCY TO BE ASSOCIATED WITH THE INSTALLATION OF THE CARRIER PIPE INSIDE THE STEEL CASING. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS SPECIFIED HEREIN, ON THE APPROVED PLANS AND IN THE SPECIAL SPECIFICATIONS.

## CASING

CASING SHALL BE NEWLY FABRICATED ROLLED, WELDED STEEL IN ACCORDANCE WITH AWWA C200 OR ASTM A139B. SPIRAL WELDED PIPE SHALL NOT BE ALLOWED. NO EXTERIOR OR INTERIOR LININGS ARE REQUIRED. WALL THICKNESS SHALL BE THE GREATER OF THAT SHOWN IN THE TABLE ON SHEET 2 OF THIS DETAIL, OR AS CALLED OUT ON THE DRAWINGS.

THE MAXIMUM ALLOWABLE LINE AND GRADE DEVIATION SHALL BE 2 INCHES, OR 1 INCH PER 100 FEET, WHICHEVER IS GREATER.

CASING SHALL BE BUTT WELDED AROUND THE ENTIRE EXTERIOR CIRCUMFERENCE OF EACH JOINT TO PROVIDE A WATER TIGHT SEAL. THE INTERIOR OF THE BUTT WELD JOINT SHALL HAVE NO GAP GREATER THAN 1/16 INCH, OR RADIAL MISALIGNMENT GREATER THAN 1/8 INCH. CONTRACTOR SHALL PROVIDE MEANS OF CHECKING LINE AND GRADE AT LEAST ONCE A DAY. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS IN ACCORDANCE WITH ASME SECTION 9. THE INTERIOR SURFACE OF THE CASING SHALL NOT BE ERRATIC, BUT SMOOTH SO NOT TO IMPEDE CARRIER PIPE INSTALLATION, REMOVAL, OR DAMAGE SKIDS.

THE CONTRACTOR SHALL SUBMIT A PLAN TO PRESSURE GROUT ALL VOIDS IN THE SPACE BETWEEN THE EXTERIOR OF THE CASING AND THE SOIL. THE GROUTING PLAN MUST BE APPROVED BY THE AGENCY PRIOR TO CONSTRUCTION.

## CASING INSULATORS/SPACERS

CASING INSULATORS/SPACERS SHALL CONSIST OF A STEEL BAND AND RISERS MADE OF T-304 STAINLESS STEEL OR CARBON STEEL WITH A FUSION BONDED EPOXY OR PVC COATING. BAND AND RISER SIZING AND THICKNESS SHALL BE PER THE MANUFACTURER'S RECOMMENDATION AND BASED ON PIPE SIZE AND MATERIAL. POLYVINYL CHLORIDE (PVC) OR ETHYLENE PROPYLENE DIENE MONOMER (EPDM) LINERS SHALL BE PROVIDED BETWEEN THE SPACER AND CARRIER PIPE. RUNNERS SHALL BE GLASS REINFORCED PLASTIC OR OTHER ABRASION RESISTANT INSULATING MATERIAL. UNLESS OTHERWISE SPECIFIED, MINIMUM INSTALLED CLEARANCE BETWEEN THE CARRIER PIPE AND OR MECHANICAL CONNECTIONS AND THE STEEL CASING SHALL BE TWO INCHES.

INSULATORS/SPACERS SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDED ORIENTATIONS TO PROVIDE ADEQUATE STRUCTURAL SUPPORT AND DIELECTRIC SEPARATION BETWEEN THE CARRIER PIPE AND THE STEEL CASING. SPACERS/INSULATORS NOT INSTALLED AS RECOMMENDED, OR DAMAGED DURING INSTALLATION, SHALL BE REPLACED AND REINSTALLED AT NO ADDITIONAL COST TO THE AGENCY. GUIDES MAY BE INSTALLED AS NECESSARY TO PREVENT RIFLING (ROTATING) OF THE PIPE DURING INSTALLATION. THE CONTRACTOR SHALL USE AN APPROVED LUBRICANT ON THE INTERIOR OF THE CASING TO AID IN INSTALLATION. LUBRICANT SHALL BE APPROVED BY THE AGENCY PRIOR TO CONSTRUCTION.

## CASING END SEALS

CASING END SEALS SHALL BE CALPICO END SEAL, MODEL C OR APPROVED EQUAL.

## CARRIER PIPE

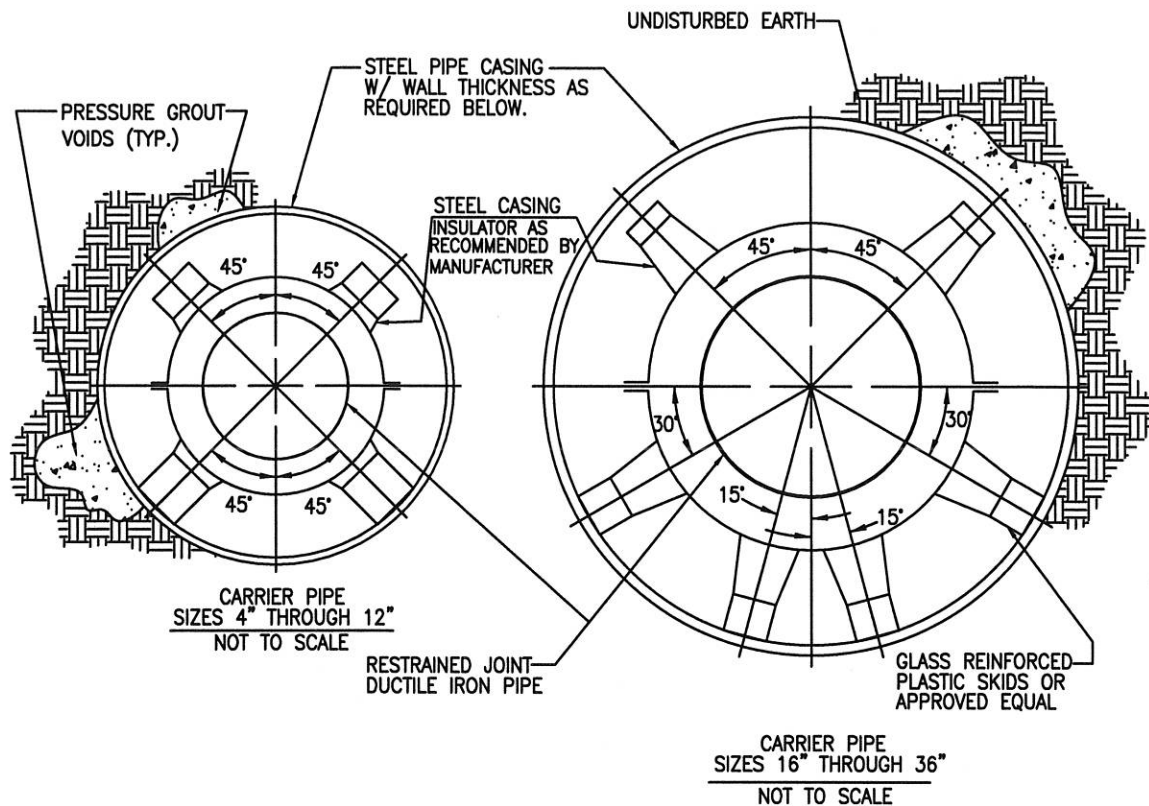
UNLESS OTHERWISE SPECIFIED ON THE PLANS, CARRIER PIPE SHALL BE RESTRAINED JOINT DUCTILE IRON PIPE AND MEET THE REQUIREMENTS OF THE TUCSON WATER STANDARD SPECIFICATIONS AND DETAILS. UNLESS OTHERWISE APPROVED, DUCTILE IRON PIPE 4-INCHES THROUGH 12-INCHES IN DIAMETER SHALL BE PRESSURE CLASS 350 AND DUCTILE IRON PIPE GREATER THAN 12-INCHES IN DIAMETER SHALL BE MINIMUM PRESSURE CLASS 250.

THE CARRIER PIPE SHALL AND INSULATORS/SPACERS SHALL BE INSPECTED, TESTED AND APPROVED BY THE AGENCY PRIOR TO INSTALLATION OF THE END SEALS.

## TESTING

PRIOR TO AND AGAIN FOLLOWING FINAL BACKFILL AND COMPACTION, THE CONTRACTOR'S NACE INTERNATIONAL-CERTIFIED CORROSION TECHNOLOGIST SHALL VERIFY THAT THE CARRIER PIPE AND CASING ARE ELECTRICALLY ISOLATED FROM ONE ANOTHER. VERIFICATION SHALL BE INCLUDED IN THE FINAL CORROSION REPORT.

ISSUED:		STANDARD DETAIL		DETAIL NO.
6/97		BORING AND CASING NOTES		SD-800
REVISED:				SHEET 1 OF 3
7/11				





PIPE SIZE	MATERIAL		
	RESTRAINED JOINT DUCTILE IRON PIPE		
	MAX. O.D. RESTRAINED JT.	MIN. CASING O.D.	MIN. CASING THICKNESS *
4"	10.20"	18"	0.3125"
6"	12.30"	18"	0.3125"
8"	14.45"	22"	0.375"
12"	18.30"	28"	0.4375"
16"	22.90"	32"	0.50"
24"	32.94"	40"	0.50"
30"	39.17"	48"	0.50"
36"	46.00"	56"	0.50"

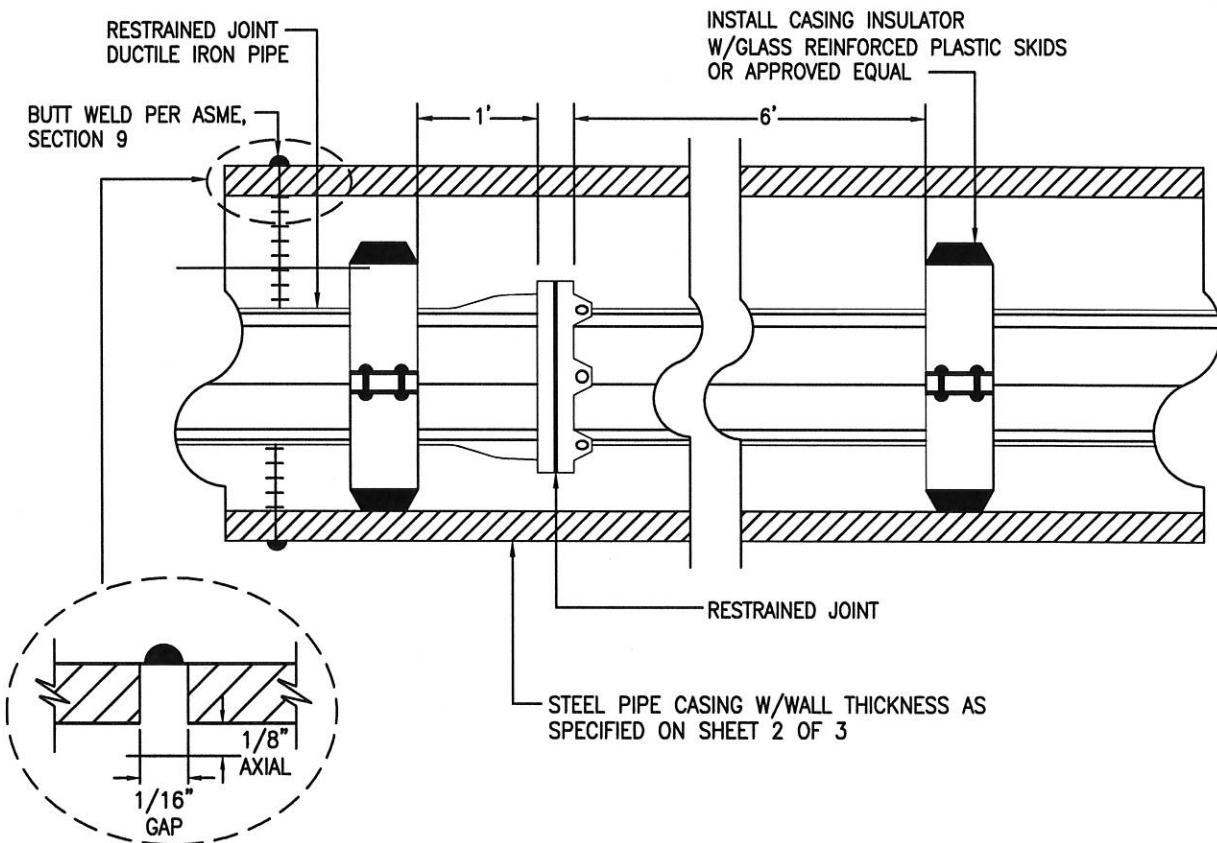
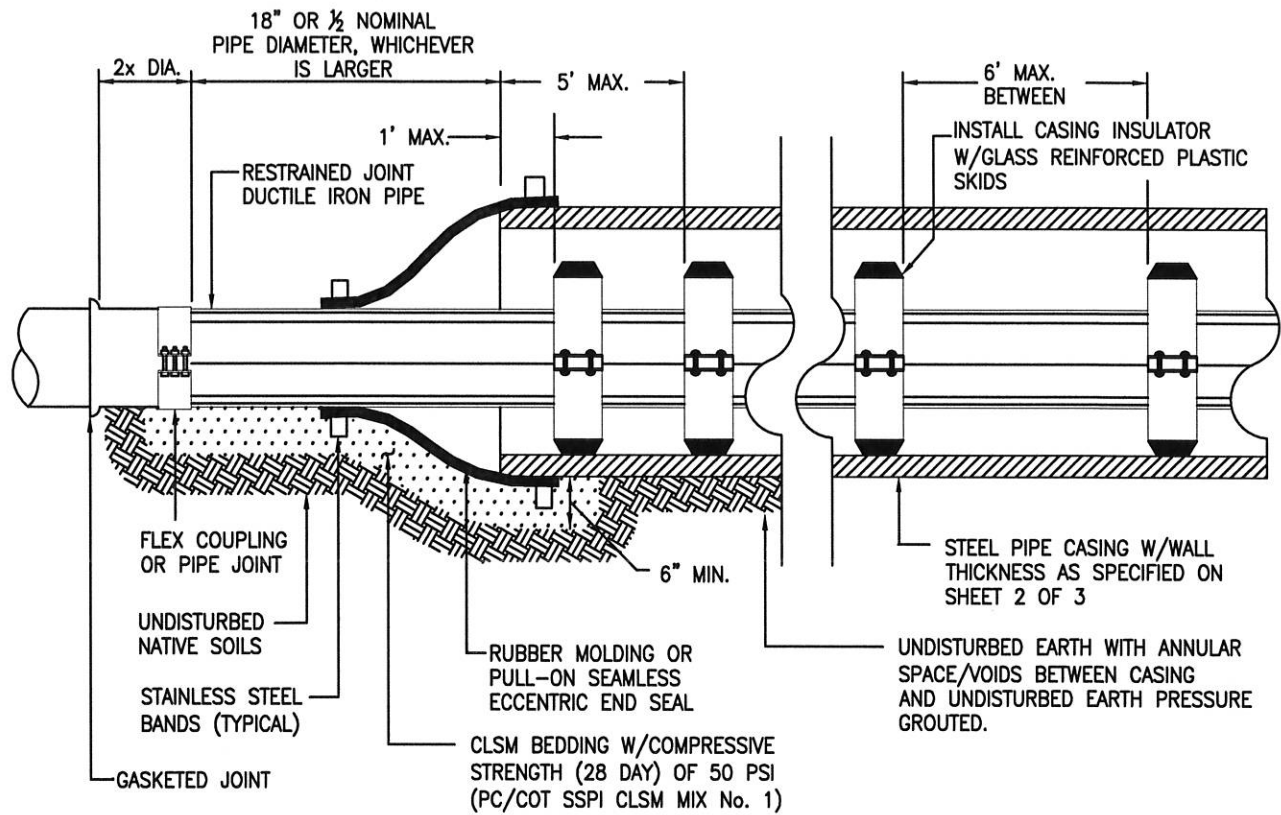
\* MINIMUM THICKNESS OF CASING GREATER THAN 56" SHALL BE SPECIFIED BY THE ENGINEER.

\*\* INSULATORS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. APPROVED INSULATORS SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER.



\*\*\* OPEN TRENCH CASING INSTALLATION SHALL COMPLY WITH PIPE BEDDING AND TRENCH BACKFILL SD115

ISSUED:		STANDARD DETAIL		DETAIL NO.
6/97				SD-800
REVISED:				SHEET 2 OF 3
7/11				

BORING AND  
CASING



NOT TO SCALE

ISSUED:		STANDARD DETAIL		DETAIL NO.
6/97		BORING AND CASING		SD-800
REVISED:				SHEET 3 OF 3
7/11				